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The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

DESCRIPTION OF SILKSWORTH COLLIERY WINNING, AND ITS MACHINERY.

The minerals under the Silksworth, Ford, and other properties, situated about two miles south-west from Sunderland, and in aggregate area about 3000 acres, have been leased for many years past by the late Marquis of Londonderry. The sinking of two pits was commenced by Earl Vane in the year 1869, to win the seams of coal usually worked in the Wear district. The works of this important undertaking have been designed by and are being carried out under the management of Mr. John Daglish, of Tynemouth. The sinking of the shafts has been entrusted to Mr. William Coulson, of Durham. Mr. J. Linsley is the resident engineer at the works.

Before fixing on the site for the pits three bore-holes were put down for the purpose of proving the thickness of sand in the locality; two of these were near the position of the pits, the third was some distance eastward. The Silksworth properties have Ryhope royalties adjoining on the east—the Ryhope pits being about 1¼ mile east from those at Silksworth—Monkwearmouth royalties to the north, Lambton royalties to the west, and Hetton and Seaton to the south, and there will be a range of 2½ miles northward to the River Wear, and 1½ mile southward to work in the Silksworth seams. The pits at Ryhope, Monkwearmouth, Hetton, and Seaton, all passed through the magnesian limestone and lower new red sandstone formations, which have recently been passed through successfully in one of the Silksworth pits.

The Silksworth pits are 200 ft. apart from their centres. The South pit is 16 ft. 6 in. in diameter; it is designed as a downcast, to be divided equally by plank brattice, forming two coal shafts, and to be fitted up with iron guides. The pit is at present sunk to the depth of 32 fms. The North pit is 14 ft. in diameter finished size, and is intended for the upcast. It is sunk to the depth of 66 fms., having passed through the limestone and sand without great difficulty. The limestone being hard, without many fissures or gullets, less water has had to be encountered than is usual in this formation. The sand was 7 ft. in thickness at this pit, was hard, and not accompanied with much water. The tubbing that has subsequently been inserted is protected by a casing of fire-bricks. This pit is intended to be fitted with iron wire-rope guides.

The strata passed through in the north pit are shown as follows:—

	Fms.	ft.	in.
Alluvial—Soil and clay	0	4	0
Magnesian Limestone	51	5	0
Marl slate (locally termed the fish bed)	0	2	6
New Red Sandstone—Yellow sand	0	7	0

	Fms.	ft.	in.				
Coal Measures—Blue metal	0	1	2				
Red metal	4	1	4				
Blue metal	0	1	6				
Coal	0	0	6				
Fire-clay	0	4	0				
Post	0	4	6				
Blue metal	0	2	3				
Thill stone	1	0	9				
Coal	0	0	4				
Grey metal	0	2	5				Fms. ft. in.
In dark grey post	1	2	0=	9	2	9=63	3 3

Water, at the level of saturation, was first met with at the depth of 25 fms. 4 ft.; fire-brick walling has been put in from the surface to the depth of 22 fms. 4 ft. 7 in., built from a metal wedging curb at the bottom, 18 in. in the bed, and a similar one higher up. The bricks are 9 in. square, 3 in. in the bed, formed to the circle of the pit, and set with lime. Below this cast-iron tubbing is inserted for 40 fms. 3 ft. 9 in., in five lengths, with a wedging curb at the bottom of each length.

		Fms.	ft.	in.
The first length of tubbing is	..	23	1	11
The second	ditto ..	2	4	2
The third	ditto ..	4	3	7
The fourth	ditto ..	5	5	0
The fifth	ditto ..	4	1	1

to the bottom of the foundation curbs. The wedging curbs are hollow, open in front, 18 in. in the bed, and single, except at the base, where two curbs are put in; the higher one is 2 ft. in the bed, the lower one 18 in. A fertile source of damage to the tubbing has been found to arise from its expansion and contraction at the wedging curbs, which being fixtures do not give with the other part of the tubbing, and to avoid this the first curb was introduced as far down as possible, almost to the depth of the sand, the tubbing above this being open topped; below this the curbs are put in 4 or 5 fms. only apart, so as to reduce the liability of open joints by the contraction of the tubbing between the curbs. It was the practice until recently to connect each section of tubbing by pipes on the inside of the pit from one section to the other, but these are rapidly destroyed in upcast shafts, besides being liable to injury in downcasts. The method adopted in this instance by Mr. Coulson, and which has been found to answer well at other places, is to have the different sections of tubbing put in connection by pass valves and pipes through each curb, the pipes being carried up about 6 ft. inside the tubbing. The valve in each pipe allows any excess of pressure in one section of the tubbing to escape into that above it successively. Before the method of connecting the different sections of tubbing by pipes was introduced it has at many pits been displaced when the pressure of water came to take effect upon it; this danger is, however, by this improvement now avoided. In the north pit the segments of tubbing are 2 ft. in height and in four degrees of strength—No. 1 at the top is 1 in., No. 2 is 1¼ in., No. 3 is 1½ in., and No. 4 at the bottom is 1¾ in. thickness of iron, strengthened further by brackets, and by ribs at the back; the latter form eight compartments in each. The front of each segment is also divided into eight compartments by slight ribs, in which squares of fire-brick, 2 in. thick, are fixed by cement; these are fixed in their places before the segments are sent down the pit. There is a space also of about 3 in. at the joints of the segments, which will be cased in a similar manner as soon as the wedging of the tubbing has become perfectly tight. This is considered a better method of casing tubbing for upcast shafts than building an independent casing to rest on the bottom wedging curb, as the locality of any leakage, which is of constant occurrence, can at once be detected.

A staple, 7 ft. in diameter, was sunk to the depth of 25 fms. at the same time as the north pit, and about 12 yards distant from it; this is also bricked, and a communication from the bottom of it is made to both pits; this drift of communication is near the top of the water-bearing strata, and serves both as a passage for water and for ventilation. In sinking through the limestone and sand, and in raising the water from them, the top lift of pumps was fixed in the staple, the lower lift or sinking set in the pit, 20-in. buckets and 6-ft. stroke in each case, worked by a horizontal engine of great power (hereafter described): 80 gallons of water were lifted at each stroke, and as the feeders did not at any time exceed 360 gallons per minute, it managed the water with perfect ease at 4½ strokes per minute. The engine, however, has occasionally performed 20 strokes per minute. The sinking set is still carried down with the sinking of the pit; this column of pumps was 41 fms. in length at the bottom of the tubbing, and is suspended from a pair of ground crabs and ropes roved through fivefold blocks. The north pit is at present almost clear of water, the water feeders from the limestone and sand are entirely excluded by tubbing; there is a slight issue from the post now being sunk through, which is drawn in the kibbles with the stones. It will depend on whether much water is got below or not as to the sinking set being taken out, and also as to any more tubbing being inserted. The weight of the pumps on the ground crabs is relieved by weighted sledges attached to two flat wire-ropes, these ropes being carried down to the lower part of the column.

At the South Pit, the upper lift of pumps, 25 fms., is placed in the pit, this with the iron cistern rest on two oak buntons, 16-in. square, fixed temporarily in the limestone. The sinking set—about 8 fms. lift—hangs from a pair of ground crabs and ropes with fivefold blocks. Both are 20-in. buckets, 6-ft. stroke; as the water is yet small in quantity the engine only goes occasionally in raising it. Part of the fire-brick walling is inserted near the top, the bricks are 12-in. square, 3 in. in thickness. It is in contemplation to erect a large ventilating fan at some future date, when required.

Steam-Engines, Permanent and Temporary.—The large engine now utilised for pumping water, is placed between the pits, and arranged to pump from both or either, by means of horizontal rods and quadrants. It is intended ultimately for raising coal from one division of the south pit. It was manufactured by Mr. A. Barclay, of Kilmarnock, from specifications prepared by Mr. T. W. Bunning.

There are two 48-in. horizontal cylinders, 23 ft. apart at their centres, 6-ft. stroke, direct-acting, 40-lbs. steam pressure. The maker has designed the valves and gearing for working expansively, being the first instance of the application of his principle to winding-engines. It is intended to raise eight tubs of 10 cwts. in each cage afterwards. The horizontal pumping rods are worked direct from a crank at the end of the main shaft, giving motion to two alternating quadrants at the top of the south pit; there is also one quadrant at the top of the north pit worked from the same crank, and a quadrant at the top of the staple, worked direct from the back piston rod of one of the cylinders, not in operation. By doubling the quadrants and pumps at the north pit and the staple, it will be seen that three 20-in. pumps might be made to deliver water to the surface, if required, giving 240 gallons per stroke. The engine is assisted by a temporary large fly-wheel. The cylinders are covered with non-conducting composition, 2 in. thick, and cleading. The foundations of the engine are built with red bricks set in cement.

The sinking-engine for the South Pit has two 12-inch horizontal cylinders, 2-ft. stroke; wheels in ratio of 1 to 3; one 4-ft. drum for round rope. It is intended to remove this engine as soon as the water is tubbed back in this pit, and continue the sinking with the large engine, which it is expected will then be done with pumping.

The sinking-engine for the North Pit has two 20-inch horizontal cylinders, 3-ft. stroke; wheels in ratio of 1 to 3; 8-ft. flat-rope drum. This is designed to be used ultimately for underground hauling; it is supplied with steam from two temporary Cornish boilers.

The crab-engine, on the west side of the pits, has two 10-in. horizontal cylinders, 2-feet stroke, on third motion. The first pair of wheels in ratio of 1 to 7, the second pair also 1 to 7, affording an increase of power of 49 to 1; one drum, 6 ft. in diameter, galvanised wire-rope, 7½ in. circumference, made to lift 40 tons. This rope may be taken to either pit or to the staple, and by this engine and rope all the pumps, rods, &c., have been put in their places; the column of pumps in the staple has been lifted entire by them. Under the crab-engine is placed the jack-engine, which has two 9-in. horizontal cylinders, 2-feet stroke; wheels in ratio of 1 to 6; one 5-feet drum. This engine drives a circular saw, and is also used in hauling from Hetton Railway to the pits the coal consumed at the boiler fires.

A portable engine, with two 7-in. vertical cylinders, 12-in. stroke, fixed to a vertical boiler, working on second motion, is now used as a jack-engine, and for grinding all the mortar used at the works.

A range of six plain boilers, 44 ft. by 5 ft., manufactured by the Grange Iron Company, supply steam at 40 lbs. pressure; four of these are fired by Vicars' patent apparatus, two are hand fired. These boilers are covered with non-conducting composition. Each boiler is fitted with one Cowburn's safety-valve, one Hopkinson's valve, two floats, glass-gauge and steam-gauge, with feed, sludge, and scum-valves at the back of each. Water from the limestone is used for feeding. It is first admitted into a large heater placed vertically, from whence it passes by turns into two large settling tanks (two worn-out boilers). The water is taken from these at 200° temperature. A horizontal engine, with one 15-in. cylinder, 2½ ft. stroke, feeds the boilers by 7-in. ram.; also drives the fire apparatus, and is adapted to act as a fire-engine merely by closing the feed-valves and a hose attachment. Two Lancashire boilers, with welded and flanged tubes, manufactured by Adamson, are being erected in another range, 30 ft. by 7½ ft. in shell, two 3-ft. tubes; one of these is fitted with Galloway's tapered tubes, six in each tube, also welded at the ends. This range is intended to be extended to eight boilers. The smoke flue passes between the two ranges to one chimney, 165 ft. in flue height, 9½ ft. at base, and 9 ft. at top in diameter. The boilers have been fired entirely with Duff coal since the commencement. A horizontal engine, of the same size as the boiler feeder, raises water from the staple by a 9-in. bucket-lift, and forces it afterwards to a reservoir placed on a hill, 78 ft. above the top of the pits, by an 8-in. ram, from which the boilers and the cottages near the pit are supplied by pressure.

The remainder of the plant of this winning we have to mention is a range of temporary shops, temporary four-legged pulley-frames at each pit, which also serve as shear-legs, and one pair of ground crabs and one cradle crab for each pit. It is intended to construct the permanent pulley frames, heapstead, and screens of wrought-iron.

The chief difficulties and risk of this great undertaking may be said to be now almost overcome, since one pit has been secured through the limestone and sand formations at a moderate outlay; and the sinking of the other pit will, in all probability, be equally successful. Both pits are intended to be put down to the Hutton seam; the probable depth will be about 300 fathoms, and two other winding-engines will be erected in line with the pits, similar to that at present in operation, which will also lift by tanks the water that may be given out in the mines.

The permanent railway is marked out, and will form a junction with the Londonderry Railway, near Ryhope, a length of about 2½ miles. 14 cottages of a superior class are built near the Silksworth pits for agents, and 60 cottages for workmen are built about ½ mile from the pits, on ground purchased by Earl Vane, on which place 400 or 500 dwellings will ultimately be built for his workmen and families.

The thickness of limestone and sand at Silksworth and adjoining collieries is shown below:—

	Silksworth. Fm. ft. in.	Ryhope. Fm. ft. in.	Monkwearmouth. Fm. ft. in.	Murton. Fm. ft. in.	Seaton. Fm. ft. in.
Soil and clay	0 4 0	3 3 0	19 3 0	6 3 0	9 0 0
Magnesian limestone	52 1 6	32 5 2	35 4 10	69 5 1	57 4 0
Sand	1 1 0	16 0 6	0 5 0	4 3 8	1 2 6
Total	54 0 6	52 2 8	56 0 10	80 5 9	68 0 6

At Haswell, where a winning was first attempted, the sand was 20 fathoms in thickness; at a distance of 700 yards from that it was proved a few inches thick only.

At Murton Colliery, where the sand was put through in three pits at once, there were three large engines, with six 19-inch pumps, each delivering to the surface, and three smaller engines, with three 16-in. pumps, each delivering also to the surface; these raised 9306 gallons of water per minute. The power of the engines is stated to be 1584 nominal, but the actual power was much greater.

COAL AND IRON IN SUSSEX.

Sir,—Reading in last week's Journal the description of the former Sussex ironworks, I was reminded of the following fact, of which I made a memorandum at the time it was told me. The narrator is a native of Sussex, and is still living. "Warbleton is in the heart of the iron district. While sinking a well deeper here, from 60 to 90 ft., I saw baskets-full of coal brought up; and as a proof of its quality, iron was welded with it." I believe the day [illegible] when Sussex iron ore will be smelted with Sussex coal. G. T.

Hosrmonden, March 21.

PENTRE COLLIERY EXPLOSION FUND.

Sir,—Will you kindly allow us through your columns to appeal to the benevolently disposed for contributions towards the fund now being formed for the relief of the widows and orphans of the men who lost their lives at the late lamentable explosion which took place at the Pentre Colliery, Rhondda Valley, South Wales, on Friday, the 26th of February last?

By this lamentable catastrophe thirty-eight men were killed, leaving twenty widows and seventy orphans utterly destitute.

The sum of 5000*l.* will be required to form a permanent fund, so as to enable the committee to provide for the widows and orphans.

Contributions will be thankfully received by Mr. Charles Bassett, manager of the London and Provincial Bank, Pontypridd; or Mr. Edward Skyrme, Postmaster, Pentre, Pontypridd.

We earnestly hope that this appeal will not be made in vain.

Lewis Probert, } Hon. Secs.
Pentre, Pontypridd, March 17. Mr. R. Phillips, }

INDUSTRIAL AND TECHNICAL EDUCATION.

Sir,—Want of time prevented me from replying to your correspondent, "Mine Agent," last week, and I am glad to find that Mr. Hunt has relieved me from any necessity of correcting his impressions as to what is actually being done at present. I desire also to observe that I have always regarded the miners as a favoured class in comparison with many other toilers in several branches of our staple industries. "The School of Mines" is not only one of the best, but, perhaps with one exception, the very best technical school we have. Of course it has not done all that is wanted, but it has done the next thing to it. It has made the want felt, and prepared the way for a more perfect state of things. What "Mine Agent" desires us to understand is, I presume, that much remains to be done, and that the mineral resources of Great Britain are not properly developed for the want of practical scientific information in those engaged in mining, and on this subject a difference of opinion is hardly possible. "Mine Agent" also says "Many, like myself, dislike universities, and prefer the good old name of school." It appears to me that this feeling arises from a mistaken idea as to what a school, college, and university should be, and the relation which they should hold one towards another. The school, as I understand it, is the common place of teaching where all may receive instruction up to a given standard on the subjects professedly taught in it. It may be a "primary school," confined to teaching the simple elementary branches of learning, such as reading, writing, arithemetic, grammar, geography, &c., or it may be a "secondary," or "grammar school." In this case classics and mathematics would be taught, with a view to training young men for some profession, or preparing them for college. The university is, therefore, a congeries or collection of colledges absorbing all, and being the goal at which every candidate for intellectual honours is striving, no matter what school or college he may be in. We adopt the same nomenclature in reference to technical schools and colleges. Industrial schools are now confined almost entirely to the children of paupers and felons, but this can hardly be so for any length of time. We have two or three good "trade schools" in England, and it is to be hoped they will rapidly increase. A secondary trade school, then, would teach science, art, modern languages, &c., with a view to preparing the pupils for college, or qualifying them to take the position of merchants, traders foremen, or other places of trust where ability and education are essential to a proper prosecution of their undertaking. Those who go to the college will, of course, pursue the higher branches of study necessary to prepare them for some profession, and the university will grant its degrees to all who deserve them.

Touching the degrees which should be conferred by the National Technical University, a former correspondent, "A. O. F.," has some sensible remarks. I assume that all degrees and diplomas will be granted to real merit only, and that once obtained they will give a man a status for life. The idea which I desire to see entertained in

every school in the United Kingdom is that any lad who distinguishes himself by good conduct and learning may obtain a scholarship which shall help to maintain him during his studies in the secondary school, and if he obtains a certificate of merit in that institution a higher presentation will be open to him for the college and university. The diplomas will, as a matter of course, differ in form from that of a doctor in natural science down to the certificate of the able pupil teacher. The great thing is to have a full and impartial examination on the subjects a knowledge of which will be required in his future career. The present examinations seem to ignore this latter subject, at least in many instances. The Royal College of Surgeons, for instance, does not require in its examination that a man should know how to cure a disease. A friend of mine some time ago desired to pass an examination in an old university, with a view to taking a degree of doctor in medicine, and found the first subject which he had to be examined in was a Greek play. Now the Greek dramas are very fine subjects of study, and to those who can appreciate them a source of infinite delight, but what relation they have to the successful treatment of the gout, fever, or small pox passes my comprehension. What will be expected, then, in the new university is a direct and thorough examination in the subject which a man professes to know, and that this should be attested by a diploma and some mark of distinction which should be recognised as of weight and value everywhere.

I think upon reflection "Mine Agent" will see that a university thus formed cannot fail to be popular, even among those who, like himself, dislike such institutions as they are at present managed. I feel certain if he had to begin life anew nothing would please him better when entering a village school in Cornwall than the consciousness that the whole road from there to the university was open and clear before him; that there were kind friends and ready helpers at every station on the way, who would initiate him into new realms of knowledge at every stage of his progress; and, finally, send him forth with credentials which should command respect everywhere, assuring honour, and if not fame, at least the means of earning competent independence.—*Storey's Gate, March* 22. JOHN MILL.

THE REGISTRATION AND PRESERVATION OF MINING PLANS AND SECTIONS.

SIR,—I know few subjects of greater importance to the nation than that of securing records of the working of its minerals. Firstly, because of the additional safety to the lives of those engaged in working near to old mining areas; and, secondly, as a matter of economy, not only of capital employed in searching after mines, but principally in securing to us the complete extraction of our coal seams and metallic veins. In the earlier workings of our collieries, for want of better knowledge in the art of mining, much coal was left in as a support to the roof, or as dams against water or fire. Much coal would be left behind, simply because plenty of the better quality could be had. Inundations of water, financial embarrassment, explosions, Chancery suits, depression of markets, and a variety of causes, may lead to the abandonment of mines. Should they continue unworked for some years, and the mine agents die, it is not unfrequently the case that all records of such mines are lost, so that if they are again brought into operation everything has to be ascertained at great cost. The possession of mining plans and sections is often considered as the mine agents' stock in trade, and we have known many instances in which it has been extremely difficult to recover from an agent who is giving up his appointment the plans of the property over which he has had supervision. Without a special agreement that the plans shall belong to the employer, it is not very certain that they may not be claimed by the agent who has prepared them. In the business of an architect this view seems to have obtained. Everyone who may have had occasion to collect sections of shafts, more especially of those recently sunk in a district, will have experienced the great difficulty of obtaining information. It does not seem very unreasonable to say that if a man has obtained information as an agent, or acquired it as a proprietor by a considerable outlay of capital, he should be allowed to use it in the way most advantageous to him. Thus, if by expensive borings in a property the proprietor should have possessed himself of information respecting the mineral resources of the surrounding estates, it would scarcely be fair to him that he should have to place the section on a public register, which may be inspected by the owners of adjoining estates. There is often the same "dog-in-the-manger" feeling with regard to boring that is manifested in the drainage of mines. Each one is looking for the other to do something, which he will avail himself of without contributing to its cost. What a man obtains by the expenditure of his capital and by his own exertions ought, one would think, to belong to him. This would appear to be the principle of the Patent Laws, though it really seems a very debateable question when we come to consider ourselves as members of a community in the welfare of which we all participate, from which it would seem that the State has a claim upon our individual genius and energy. This is not, however, the spirit which has moved men forward to those exertions and energies which have made the State what it is. But we live under a different social aspect from what our forefathers did. The mutuality of our interests is becoming daily more apparent, and therefore we must look upon all questions which are of wide proportions as being national. Thus, whilst our mineral resources were supposed to be unlimited it was no time for legislative interference for securing records of mining operations. Now, however, that we have had it very plainly put before us that our annual output is constantly increasing, and that there is some chance of our commercially available coal becoming exhausted, the disaster of its ultimate failure becomes a national question. We issue a commission to make every possible enquiry respecting it, and the means of averting it, and upon the report of that commission no doubt there will arise legislative interference respecting waste in all its shapes. No sensible person can object to this. Though it be admitted that a man may possess himself of all the information he can, and keep it—which is not admissible, it can never be conceded that a man may waste as much as he chooses. He may divest himself of his property, but he may not destroy it.

Would it be tolerated for one moment that a heap of some 500,000 tons of coal should be piled together and set on fire for the amusement of some scapegrace, even though the spot selected were some arid waste, where no harm to vegetation or erections could ensue? No! Nor will it be tolerated that millions of tons of coal shall be allowed to remain in our mines without some record being kept of it—so that when the time comes that its production is needful to the welfare of the nation, in however indirect a manner, it shall be worked. Labour wasted is a national loss. It adds nothing to the common stock. True, the employment has other collateral advantages, such as finding food for the lower orders of the population, but it then becomes merely a vehicle for the circulation of previously accumulated means. It adds not to the wealth of the country. Yet, see the thousands which are wasted in working old mines, which might otherwise be saved. We do not mean to say that old mines are not profitable, but we say that much money is wasted in searching after patches of coal, sills and pillars, and accidentally tapping large pounds of water; and all this waste of labour will accumulate as our coal fields become more and more worked, unless some system is devised for keeping records of former workings.

Now, this principle of communism appears to be daily spreading, one of its first developments being submission to public opinion, and in after times legislation will complete the work. These are signs of the times which are not to be misconstrued, and for our own part we hope signs which indicate the welfare of the nation protected from the influence of individual interests. That this condition will obtain there can be no doubt, for legislative enactment means only the enforcement of public opinion—that is in principle, although it may to some extent be subverted in practice.

It is only upon such views as these that we can hope for a measure in Parliament which shall save many remnants of valuable minerals from ultimate loss. The law does not allow one to enjoy his property to the disadvantage of another, and in the same way no member of a community has a right to prejudice the interests and welfare of the State. It must be admitted that the subject is involved in some complications. Thus, it may be said, if the State is to take the benefit of individual exertions as a right, and without compensation, it would limit a man's endeavours to such things as would tend to benefit himself individually, for it is in that way that he sets himself before his fellows, which, though not the most christian-like or moral motive, is at least the most human. The tables are, then, turned against the State, of whom it will be some day asked that it should find the means to bore the holes and sink the trial shafts in unproved districts, since private speculation cannot secure to itself the advantages of its own discoveries. And yet, in the face of all this, there can be no doubt of the wisdom expressed in the opinions of the practical men given in your paper of the 11th inst. Can the information be gleaned by voluntary means, in the same way as the Mineral Statistics? As we grow more enlightened there is a greater tendency to lay open to our fellow-men the stores of our knowledge. Could it have been supposed 30 years ago that a body of ironmasters, like the Iron and Steel Institute, would have written papers upon their various methods of manufacture, showing where they can economise in fuel and labour, and these to be read before their fellow-manufacturers? Such, however, is the case, and there seems to be a strong tendency in the professions of mining, civil, and mechanical engineers to do the same. Whether this spirit will develope itself so far as to render it unnecessary for legislation in order to secure the registration of plans and sections of mines remains yet to be seen. At the same time, it is certainly one of the most important of national interests which is involved.

Shrewsbury, March 15. DANIEL JONES, F.G.S.

THE PATENT LAW LEGISLATION.

SIR,—I feel much gratified by your so kindly inserting in the Journal, and thereby assisting me in my humble efforts of bringing forward a plan to obviate the necessity of abolishing the Patent Laws, and alleviating the hardships and sufferings of our poor inventors, for the want of funds to enable them to bring out their several schemes, which encourages me to write again, to give my plan more in detail.

In the first place, should we adopt the plan of Mr. Macfie and his friends, and do away with patents, I imagine it would create much confusion in this and foreign countries, except they exempt the present proprietors of patents, for which fabulous sums have been expended. Surely, their private interests should not be cast to the winds, frustrated, made valueless, and their inventions given *pro bono publico*. I have not yet seen Mr. Hinde Palmer's Bill, although I observe by Mr. Campin's letter (in the Supplement to last week's Journal) that "it is issued to the public." Surely, he must offer some inducement and reward for inventions? If he has not, our race of inventors will decay, and gradually we shall remain in a state of *statu quo*, and have to depend upon foreigners for any new idea? But why should such a sad state of affairs be tolerated when, without much alteration of our Patent Laws, or forming any "new commission court," we can proceed in the old manner, making the rich inventor pay the usual fees? I cannot see that we require any alteratien, except for the poor man's cause.

I propose that all inventions should be registered free of charge, to enable persons to have their models made without fear of having them seen. At the present time how difficult it is to get a model made, when we are afraid to give proper directions, lest the workman should take advantage. Generally a poor inventor employs a poor workman; he cannot employ first-class workmen or materials. I suggest that establishments should be formed to make models only, and Government should pay all expenses for the poor inventor, and even support him through his state of probation. After his model is perfected and examined, registered, and a patent granted, free of all expense, he could then begin to manufacture, and soon repay his debt to the Patent Office with thanks and gratitude. Should he forget his obligations let his patent be annulled, if all expenses are not paid fourfold, or sold to settle all the Patent Office claims.

Little do people know the care and anxiety of a poor inventor's life. I well recollect a fine description of the life of an inventor, published some years since, written by "Hampden," which would be well to reprint. The greatest precision and care should be taken with the register to prevent lawsuits, of which I cannot see the necessity, as should two persons claim one patent I should think it would only require to turn to the register and trace which of the two registered first, then give a common notice to the infringer, and strike his name from the register.—*March* 22. E. M. S. P.

AMERICAN MINING TITLES.

SIR,—In response to the enquiry of your correspondent for the views of an American on the subject of our Mining Laws, I present your my ideas on the subject very hastily written out, but which may, perhaps, give some notion of the working of miners' customs and mining laws. First, as to the formation of a mining district. A section of country having been discovered to be minerally rich, the miners making the discovery hold a meeting, and make laws defining the boundaries of their district, and electing one of their number recorder, whose duty is is to go, personally, on the claims with the locators, stake off the ground and keep a record of them. As the mining laws of most districts are very similar, one will serve for all. The regulations of Virginia district, Nevada, declare—

Art. 1.—All quartz claims hereafter located shall be two hundred feet on the lead, including all its dips and angles.

Art. 2.—All discoverers of new quartz veins shall be entitled to an additional claim for discovery.

The laws go on to define the amount of work necessary to be performed every month for each claim of 200 feet, and in some instances the amount of money to be expended, or the amount of labour performed to make the title to said claim real estate. The work done, in this case, must be plainly in excess of the amount specified, which is usually not less than 200*l.*

If the parties who have made a location leave the section without making provision for the performance of the labour specified in the district laws, the property becomes subject to re-location, at the option of the recorder. His certificate of re-location is considered binding if no great amount of work had been done on the claim by the first locators; but parties of much experience in mining are averse to purchasing a re-location title, if a shaft or tunnel had been run far by the first locators, and prefer obtaining from the latter a certificate of abandonment before proving their claim valuable, and then, perhaps, having their title to the property contested by the first locators. The recorder should not, and if he is a man of integrity will not, record a title if there is any doubt on the subject. But it is well to be doubly sure on this point, and ascertain which of the two parties, the first or the second locators, performed the most work, for although in litigation about the matter the question of title would turn on the point as to whether the property was obtained according to miners' rules, still before a miners' jury the question would hinge on the amount of labour put on the property. A first location, with uninterrupted possession, is certainly a good title to a mining property, and no capitalist need hesitate to purchase, if he thinks the mine rich. In this connection, the remarks of Senator Stewart, the present Chairman of the Committee on Mining in Congress, made a few years ago at a meeting held in the Cooper Institute, New York, may be read with interest:—

"But it is said that these mines are all on the public lands, and that the miner has no title or right of possession which he can give as security for money. This has been a great drawback to the mining community in obtaining European capital, which was more inclined to seek investment than American capital, on account of the superior information of the people on the other side of the Atlantic in regard to the whole subject of mines. But a familiar knowledge of the condition of things in the mineral countries ought to satisfy any American that there is no practical difficulty on this point, and that the miner's possession must be regarded as title. It is so treated in all the mining States and Territories. The emigration to California, immediately after the discovery of gold, carrying with it the principles of the common law, and being thoroughly imbued with equity and fair play, established, in the various mining communities customs, rules, and regulations fixing the extent of mining claims, guarding against the possibility of monopoly, and determining the necessary development and labour for retaining a valid and *bona fide* possession of the mines. These rules and regulations, although formed in hundreds of mining districts, without any apparent concert of action on the part of the miners, were almost entirely similar in their general provisions, and operated so beneficially upon the prosperity of the country, that the Legislature of California, in the year 1851, passed a general law—'That, in actions respecting mining claims, the customs, rules, and regulations of the miners themselves might be offered in evidence, and when not in conflict with the Constitution of the State or of the United States, should govern the decision of the action.'

"Under this sanction of law a system of mining regulations has grown up on the Pacific coast, and has been commented upon and sustained by the courts of justice, until it has become a body of laws as just and consistent as the original common law of England itself. Nevada, at the first session of her Territorial Legislature, adopted this system by express enactment, and all the mining territories of the West have followed her example. Nor is this all. Congress has sanctioned the system and recognized the validity of the miner's possession. At the last session of Congress, in the organisation of the United States District Court for the District of Nevada, the question arose as to what rule should be enforced by the United States Courts in controversies respecting mining claims upon the public lands, and the following section was adopted:—

"'No possessory action between individuals, in any of the Courts of the United States, for the recovery of any mining title, or for damages to such title, shall be affected by the fact that the paramount title to the land on which such mines are, is in the United States; but each case shall be adjudged by the law of possession.'

"This law is, to all intents and purposes, the adoption of the rules and regulations of the miners. By the decisions of the Supreme Court of the United States the State laws govern as to questions of possession and all local matters; and the adoption of the law of possession by Congress enacts in effect the State laws, which I have before shown recognise the miners' customs, rules, and regulations.

"The miner, then, has a possession which is recognised not only by the State and Territorial Courts, but by all Courts of the United States, and this, too, with the concurrent action of State and Federal legislation. He has more, he has a possession which the Government has encouraged, and never disputed during the last seventeen years, which he has secured under the avowed policy on the part of the United States, that the mines should be held free for exploration and development."

I shall now cite a case of the power of the Goverment to seize a mine. In 1863, President Lincoln directed the United States Marshal for the Northern District of California to take possession of the New Almaden Quicksilver Mine, and the general in command of the Government troops on the Pacific was ordered to furnish troops to enforce the seizure. They proceeded on their errand, but found the mine fortified against attack. The Governor and leading capitalists telegraphed to Washington, "For God's sake, withdraw the order to seize the New Almaden, or there will be a revolution in the State." The miners commenced arming themselves, and informed the superintendent of the Almaden Mines by telegraph that they were coming to his assistance by thousands if necessary. The President then disavowed the order, the Government organ stating that it had been obtained from him by fraud, and the possessors remained quietly in possession of their mine. No stronger case than this can be adduced. The New Almaden Mines were possessed by foreigners, who had often charged what the miners thought exorbitant prices for quicksilver. For these reasons, there was an antipathy to them rather than sympathy, yet the mining population rallied to a man against their being forcibly dispossessed of their property. In the opinion of a great many persons, if this seizure had been peaceably made the entire mines of the coast would have been taken by the Government for a source of revenue. During those revolutionary times the greedy eyes of certain members of Congress had been attracted to the mines by their immense yield, but the resistance met with on the onset proved that the mines would always remain the public domain, open to the energy and capital of all. The Act of Congress respecting patents having been found by experience to be slightly defective, has been remodelled, and will be passed the present session in an improved form. By any one fully acquainted, however, with mining laws a patent claim will not be considered of more weight than first location with undisputed possession. R.

BUCKEYE AND CHAMPION MINES, EUREKA, NEVADA.

SIR,—I notice a discussion in the Journal of a somewhat personal character as to the value of this property. In the judgment of Mr. Evans it was not worth the price put upon it, but the fact that it is a very valuable and productive property has been fully established to the satisfaction of the shareholders. The February dividend was $1 per share, 60,000 shares—about 12,000*l.* The company is known as the Eureka Consolidated.

Transactions in shares at the San Francisco Stock Exchange are genuine. I have bought and sold these shares at the board. It is true dividends do not always represent profits. In the case of this company large additions to the works and acquisition of more mining ground has absorbed quite an amount of their earnings, but the company has a good surplus after paying this dividend.

The former superintendent of the Hamilton Smelting Works, erected by myself, was in charge of the Eureka furnaces, and on his own plans constructed their new works, which are most successful. I investigated the facts in regard to the mines and the operation of the furnaces for my own benefit. Should not parties who invest in mines take *working results* rather than opinions of any man as to what a property may do? A gentleman sits in his office in London and says, "the Eberhardt and Aurora Mines will not hold out three years." I think "A Stockholder" would feel more sure of his profit to see the accumulation of rich ore now on hand, and the untouched reserves in the mines, than he would on any opinion given in London on the probable depth to which the vein may penetrate. The Nevada Mines do hold in depth. The ores of the Buckeye and Champion, Maryland, Jackson, and other newly discovered mines, have very materially increased in quality and quantity from the surface to the deepest workings. Some of these ores pay a large profit over the cost of mining and shipping by rail and steamer to Liverpool, an expense amounting to about 18*l.* per ton, and which will be saved when more mills and furnaces are put in operation.

Princes-street, Cavendish-square, March 21. J. R. PARTRIDGE.

P.S.—I send two extracts from Californian papers in further proof of my statements:—

A Telegram to the Sacramento *Record* from Palisade says:—

The Eureka Consolidated Mining Company have shipped nearly 200,000*l.* of bullion from this place during the past two weeks, consigned to their care at San Francisco. Reports are constantly coming from the mine which represent it as being in better condition at present than ever before. There are now over 1500 tons of ore at the furnaces and the dumps. Some of the best miners on the coast, both practical and scientific, say there is enough ore in sight to run all their furnaces for six months. Their new furnace will be in operation on the 21st instant, when they will be able to run out double the amount of bullion ever before made. Their capacity will be something over 10 tons per day. Contracts have been made for a new 20-stamp mill at Mineral Hill, to be completed on or about June 1. Parties coming from Mineral Hill say there is enough ore now on the dumps and at the mill to run them for two or three year.

The San Francisco *Stock Bulletin* says:—

The Eureka Consolidated has met with large sales at steady rates, opening at $12½, and closing at $12¼. A dividend of $1 per share, aggregating $60,00', will be paid on Monday, February 20.

THE TAQUARIL GOLD MINE.

SIR,—A very important fact relating to this mine appears to be quite lost sight of, or not generally known, which is, that when the former proprietors were compelled, owing to defective pumping machinery, to abandon the mine a very rich vein of gold was left going down in the bottom level, *east* of the old engine-shaft, which vein cannot have yet been reached by the present company—that is, assuming Capt. Penglily's report, issued with the prospectus, to be a truthful one, as in that he states—"With a little alteration to the pitwork or pumping gear, and also to the engine, we managed to get the water low enough to see a splendid vein of gold; without exaggeration, the richest I ever saw." After stating that the water again overpowered them, he goes on to say—"The No. 2 lode is very favourable for quarrying, and was only discovered about 12 months previous to my going there in 1837, by sinking the engine-shaft from the bottom level to make stopes, in order to work the hard lode, and to obtain that splendid vein that I mentioned before, which is about 4 fms. east of the shaft."

If those shareholders who have the monthly reports from June last will refer to them, they will find that no mention is made in any of them of any discovery east of the old shaft; therefore, if this splendid vein of gold was there in 1837, it is certainly there in 1871, and in all probability we shall soon hear of its rediscovery. I might mention that it is stated in the monthly reports of June and July that a level north-east of shaft had been cleared out 3 fms. 5 ft., since which time no mention has been made of this level, which has probably been suspended owing to the difficulty in keeping the water out of the old workings.

March 13. A SHAREHOLDER.

TAQUARIL GOLD MINING COMPANY.

SIR,—As a holder of 500 shares, I would most cheerfully support the proposition of your correspondent who signs himself, "A Holder of more than 1000 Shares," in his proposition to appoint a properly qualified authority to inspect and report upon our mine; and I would suggest that Mr. Gordon (the superintendent of the St. John del Rey), together with one or more of his underground agents, should be nominated. If "A Holder of more than 1000 Shares" is unacquainted with the irreproachable character and practical integrity and consistency of Mr. Gordon, he will perhaps allow me, as a very old shareholder in St. John del Rey, to state that it is not possible to select a better man than Mr. Gordon—seeing, as your correspondent very properly desires, the selected person should be above suspicion and reproach. When the St. John del Rey yielded 100,000*l.* a year profits Mr. Gordon did not put forward any statement—although he undoubtedly possessed "ocular and tangible evidence" enough to support it—"that they possessed the richest gold mine in Brazil." The *only* difference between the practical acumen of Capt. Treloar and Mr. Gordon is that the former *told* us in most unequivocal language that Taquaril was the "richest mine," but, like the fabled mountain in labour, brought forth something worse than no-

thing; whereas the latter, with that unostentation inseparable from true skill and merit, brought forth the substance in the shape of large dividends. Capt. Treloar must be taught that shareholders would like less froth and more "tangible evidence" in the shape of returns—less words and more work,

I would further suggest that your correspondent should at the ensuing meeting move for the appointment of a committee of investigation, with the power to examine the transfer-books; because, as a legal man, I may inform him that, if there be any doubt whatever about the *bona fides* of any management—that is, if the shareholders have cause to believe that by unsupported statements profits have been realised—the Court of Chancery will readily afford the necessary power to unmask the whole transaction. Most cheerfully will I support your correspondent by subscribing my quota of any expense that may be incurred.—*March* 21 A HOLDER OF FIVE HUNDRED SHARES.

THE TAQUARIL GOLD MINING COMPANY.

SIR,—It is quite natural that shareholders in this undertaking should feel greatly disappointed, and find the late reports from the mine strange and contradictory; but that unfair dealing on the part of our local managers should be hinted at in connection with those reports appears to me a somewhat hasty proceeding, even from a "Holder of more than One Thousand Shares." I happen to know a little about those gold deposits in jacotinga mines, which, while they are generally lucrative to the permanent investor, prove not seldom ruinous to the timid holder, by their fluctuating nature. I also happen to know the unreproachable character of our manager, and I am, therefore, quite convinced that the first favourable advices after the opening of the old workings were *bona fide* reports, inspired by the dazzling view of the gold nuggets extracted from a few tons of excavated matter. One of those rapid temporary changes in the "shoots" of gold has evidently since set in, and, being in the height of the wet season, water in the bottom of the mine has impeded vigorous explorations in search of the vein. The appointment of a committee of investigation, as suggested by your correspondent, would be a precipitate step; a little time and patience will most probably elucidate matters much better. In February the rains generally abate considerably, and allow them to execute such works as will prove the capabilities of our property.

If our managers considered the mine as one of the best in Brazil they were not the only ones who thought so. The late proprietors would certainly not have driven so many fathoms of level in adamantine limestone, long after their works on the lode had closed, had they not been equally convinced of the great value of Taquaril. There are actually no better authorities, if any, on jacotinga mines in Brazil than our managers, and it would, I think, be difficult to find one in England sufficiently experienced in this speciality of gold mining who could conscientiously undertake an inspection of the mine; at least, I would *not* "cheerfully subscribe my quota towards the expense," although only a

March 21. HOLDER OF ONE HUNDRED SHARES.

THE TAQUARIL GOLD MINING COMPANY.

SIR,—The able letter of your correspondent on the above mine and its management proves beyond question the necessity of immediate action. How shall the shareholders ascertain the real state and prospects of the mine? By sending some reliable and honest man of practical knowledge to inspect and report on the property, or employ mine agents now resident in Brazil—Mr. Gordon and one of his agents of St. John del Rey, or Mr. Richards of the Braganza Mine, who was at Taquaril until he was replaced, and who cannot be accused of ignorance of the mine or the district. To send an agent from this country would, probably, cost 300*l.* to least, to employ the gentlemen named above, probably, not more than one-tenth the above sum. As an original shareholder, I have no confidence in Capt. Treloar, nor can I ever have again, whatever be the result of the working of the mine. I would also recommend a meeting of a few large shareholders, who shall depute three of their number to call upon the directors, and request an order to examine the share ledger, reports, and documents relating to the said mine since it came under the control of the present company, and report to the shareholders, advising whether it be to the interest of the shareholders that Capt. Treloar, who ought to visit the mine once in three months, should be dismissed, and a qualified and trusty agent appointed to take his place. If the share ledger would not solve the query—why these miserable reports and returns—then we are apparently the dupes of misplaced confidence. Capt. Pengelly has stated this month that with five negroes blindfolded he would break more gold in 24 hours than Capt. Treloar has yet returned. Capt. Pengelly has known the mine for 20 years. Let, then, action be taken quickly, and let us rescue a property which all reports hitherto written (leaving all Capt. Treloar's out of the question) represent as most valuable.

AN ORIGINAL HOLDER.

THE TAQUARIL GOLD MINING COMPANY.

SIR,—I can fully sympathise with your correspondent in last week's Journal, for I also am the possessor of a large number of shares in the Taquaril Company, and confidence in Capt. Treloar's judgment and positive assertions induced me to hold on. But now that confidence is greatly shaken, and that from more causes than one. As regards Taquaril, Capt. Treloar once buoyed us up with the prospect of a large importation of Taquaril gold before the end of last year, and many, no doubt, who have bought at high premiums are now repenting of their trust in his oft-repeated assurances of large and speedy returns; while those behind the scenes have, it may be, largely profited by the rise consequent thereon, and some will probably further benefit also by the fall from the adverse reports; for if the mine be all the while a really good one, as I would fain believe it is, selling at a premium and buying at a discount may prove a very profitable amusement, though, under certain circumstances, it is better to say nothing of the honesty of the proceeding.

In the purchase of the Gongo Soco Mine for the Rossa Grande Company we have another instance of Capt. Treloar's confident assurances, followed by signal failure. On that occasion we were told that "after working for some time, the line of gold (westward) was lost; but Capt. Thos. Treloar, who was then chief mining engineer on the property, states that he informed the superintendent and directors he was certain he could again find the line, which he afterwards succeeded in doing, and took therefrom a large quantity of gold in paying quantities, and *feels sure he could do so again.*" This, however, he has not done, and it is to be feared never will, but that both the cost of purchase and that of re-working will prove a dead loss to the Rossa Grande shareholders. And now there are rumours of like purchases of additional mines for other companies under the same direction; and can we hope for better results? Have not the shareholders good reason to fear that these additions will be only additional means of exhausting their capital and increasing their disappointment? Would not the best course for them be to bring these companies to a close at once, and save further useless expenditure? The selling value of the share capital of some of these companies is absolutely less than the amount of a single call. Is it just or reasonable, then, to go on making calls when this is the case?

The present position of the Don Pedro Company is also, in my opinion, another instance of great want of judgment—whether in Capt. Treloar or who else I know not. Why in this case was the erection of sufficiently powerful pumping machinery left till they were absolutely driven out of the paying part of the mine by the increase of water? Truly this result ought to have been foreseen long before, and provided against in time; and the reserve fund might have been profitably employed for this purpose. If a little judgment had been exercised in this way, probably the shares would never have been so depreciated as they have been. Who shall tell us the reasons for this inaction?

WHEEL WITHIN WHEEL.

THE NEW QUEBRADA COMPANY.

SIR,—I begin to be a little uneasy about that interesting body, the New Quebrada board, and feel ready to exclaim—

"Dear departed shade,
Where is thy place of blissful rest?"

About nine years ago I was induced by as brilliantly seductive a prospectus as ever dazzled the eyes of a discerning public to become a shareholder in the Quebrada Company (Limited), just then forming. We were assured, upon the undoubted testimony of eminent engineers and other intelligent and conscientious functionaries, that there was an enormous mountain of the richest copper ore in the world, with the mines already laid open—an extensive forest of choice and valuable timber, and a range of fertile land extending from the mines to the sea, a distance of 50 or 60 miles. All that was required to pour a flood of wealth into the laps of the delighted shareholders was *a road*—simply a road—through their own land, to convey its varied and valuable products to the coast. I am not going to be so unreasonable as to complain that this road is not yet completed, because I am aware that the directors have dreamily struggled through the whole of this nine years to make up their minds as to the kind of road best suited to their purpose; and this point is not determined upon yet, but is still under discussion. Of course, during this lapse of time many individual changes have taken place among the body of directors. The names of some having become enrolled in the bills of mortality, they have sunk, therefore, if possible, into a still deeper slumber. But it appears that the same, I will not say "mantle," but the same night-cap, has always descended upon the successor, which had wrapped in forgetfulness the senses of his predecessor. Moreover, I believe, there still survive some who enjoy the distinguished merit of having personally gone through the whole of this official hibernation.

Now, as I avow myself an admirer of that kind-hearted clergyman who, upon noticing some of his congregation asleep, instantly subdued the tone of his voice lest he should disturb their repose, so would I avow saying anything loud or harsh in the presence of these peaceful men. I would merely, with all gentleness, and with a full sense of their merits, venture to assert that they cannot be accused of rashness, undue haste, or precipitancy. And to the philanthropic shareholders I would suggest as a solace to their spirits that there is a possibility at some future time, not easy precisely to calculate, that some benefit may be derived from this splendid property, and enjoyed by their remote descendants.

A PATIENT ORIGINAL.

ANGLO-AUSTRALIAN UNITED GOLD MINING COMPANY.

SIR,—I have just received the balance-sheet of the above company, and in perusing it one cannot help being forcibly struck by some of the items. Foremost among these is the large sum (16,000*l.*) paid for the property. There surely must have been a pretty little job here for somebody's benefit, or property must have suddenly become very valuable in Australia that so large a sum should be demanded for the mere leasehold of an untried piece of mining ground. The lumped item of preliminary expenses, too (1120*l.*), makes a pretty little figure; then comes the remuneration of the honourable board of directors (918*l.* 15s.), nicely calculated to months and days—let us hope that no hours and minutes of their valuable labours were omitted in the reckoning.

Now, looking at so large a payment, one is led to ask, What is the work done for it all, and why is so large a number of directors required? Is it the united wisdom of so many (the mystic seven) that we must look upon as an equivalent for so much money, or may we conjecture that it was individual need that brought so large a body around the carcase? For my part, I cannot see what effect their united wisdom can have either on the productiveness or working of the mine. Indeed, as regards the latter part of the business, I presume that Messrs. Kitto and Lamb have it much their own way, and nobody will doubt, from the item of expenditure set against their names, that they are well paid for it, without paying the directors so largely for letting them do it. To be sure a sop is thrown to the shareholders—a little one of 600*l.* among them all—in the absurd form of interest out of capital; and what advantage will this be to them when they shall be called upon, as is too probable, to subscribe extra capital, to take up preference shares, and all that sort of thing, as in the case of the Australian United?

There are two or three other items which puzzle me in the balance-sheet. Can anyone explain to me the difference between "mine wages" and "sinking shafts and winzes." I, in my simplicity, have been accustomed to the notion that mine wages were paid for doing these things. A SHAREHOLDER.

PYRAMID RANGE COMPANY.

SIR,—Referring to the above company, "An English Investor" states in last week's Journal that Mr. Fry "has been President of the . . . . Cholla Potosi," &c. Mr. Harmon having been elected President of the Cholla Potosi Company on its formation in 1855, and having continued so to the present time, this statement is evidently without foundation.

So much for one statement! Will the old quotation apply?—"*Ex uno disce omnes.*" P.

P.S.—I see, and it will doubtless gratify Mr. Evans, that the Eureka Consolidated declared, on Feb. 20, its first dividend of $50,000.

Yield of the mines in White Pine District, Nevada, for the quarter ending Dec. 31:—8115 tons 125 lbs., valued at $297,134·47, divided as follows:—Milling ores worked, 7778 tons 1291 lbs., value $284,895·15; base ores smelted, 39 tons 732 lbs., value $3975·71; dumps of ore sold, 297 tons 42 lbs., value $8253·62. Amount of State and county taxes on same, $4277·47.

THE EBERHARDT AND AURORA MINING COMPANY.

SIR,—No mine even at the present advanced price, which to-day I see is about 20*l.* a share, offers the advantages to investors that Eberhardt does. When the prospectus was issued it was estimated that the minimum yield of the ore would be $40 to the ton, and the samples given to Mr. Ridesdale showed a yield of $900 down to $23, so that $40 was a very low estimate; and experience has proved that it was very much under the mark, for the ores lately crushed yielded $120 to $140 to the ton. The minimum dividend, reckoning $40 to the ton, and $27 for working expenses, leaving a profit of only $13, would have been 50 per cent. But what must the company pay now that the ore has turned out so much richer than was estimated, and they have, besides, got another valuable property—the Ward Beecher? The former proprietor of the Ward Beecher must have some faith in the concern, seeing that he transferred his mine to the company without asking 1s. in cash. He simply asked 1000 shares, and those shares he estimated at the value of 60,000*l.* The shares are being largely purchased by persons in San Francisco—people on the spot—who know the value of the mines.

Camden Town, March 22. E. H.

CAPE COPPER MINING COMPANY.

SIR,—Can any reader oblige me by throwing some light upon the present circumstances of this company? A report for the year 1869 was published in the Journal last September, and is now before me. At the general meeting the Chairman stated that the probable balance of profit for that year would be 25,000*l.* By this time the accounts for 1870, too, must surely be advancing towards completion, and yet not a shilling on account of the returns for either of the two years has hitherto reached the shareholders. The last division of profit was for 1868, and a very good division it was—only one hopes it was not a kind of "final dividend."

I submit, Sir, that two years and a quarter ought really to have produced some further result. From time to time accounts of progress have appeared in your own columns and elsewhere, all very satisfactory—but no dividend. Sales of ore are announced—but no dividend. If there *are* proceeds in hand, why are they not divided among the proprietors? If there are none, it remains for the directors to justify their conduct in issuing the 5000 new shares at a premium, thus depreciating the original stock; and, above all, in accumulating such a large reserve fund in diminution of our fairly earned profits. To me, and probably to others, the present state of affairs is really serious. My small investment represents the results of years of rigid economy, and was relied upon as a permanent addition to my limited income.

I am aware the price of ore has been very low, and that business is altogether very bad just now. Directors have their difficulties, no doubt, but in times like these the poorer shareholders have very strong claims on their consideration, and it is not the first time that this important company has acted in a similar way. Once before there was an interval of nearly two years, covering the whole of 1867, during which nothing was divided. At the present time the shares are worth 5*l.* each *less* than they were before the new issue took place; and when we see a large sum deducted from our profits, and locked up, to carry out some financial theory—*whim*, many persons would call it—a little impatience is only natural. If your allowing the subject to be ventilated in the Journal obtains any redress, you will have the sincere gratitude of many—

A POOR SHAREHOLDER.

WEST CHIVERTON, AND ITS MANAGEMENT.

SIR,—I fully agree with your correspondent who, in last week's Journal, called upon the committee of management to put forward some statement as to the financial condition of the mine. If what I hear be correct, that some of the members of the committee have been for some time past quietly but constantly feeding the market with their shares, the decline in price from 50*l.* to 36*l.* is sufficiently accounted for. Members of committees, like other shareholders, can, of course, buy or sell shares whenever they please; but timid holders (of which, unfortunately, I am one) ask themselves the reason why members of our committee are the large sellers. It is to be hoped that the old saying about rats and ships has no application in this case. If the financial condition of the mine is really unsatisfactory—if the mine is not looking so well as outside shareholders have supposed—if the returns have been in a greater proportion than the reserves have increased, or, in other words, the mine has been worked two fast—why do not our committee let us know it, and at once apply the remedy? Mention is made of a certain amount of money (some say as much as 9000*l.*) having disappeared from the credit side of the account. If such be the case, the amount having been absorbed by merchants' bills, ought not shareholders to be acquainted with the facts? At present, if one may judge from what one is told, shareholders (who should be kept fully informed) are allowed to group about in the dark, while others (presumably at least) are aware of the precise condition of affairs. Is this just—is it common fairness?—*March* 21. A SHAREHOLDER.

THE VAN MINE, AND ITS SHARES.

SIR,—The letter of "A Shareholder," in the Journal of March 11, so clearly demonstrates the great value of this truly wonderful mine, that the suggestion therein contained, as to a multiplication of the present small number of shares into which it is now divided, demands more than our ordinary consideration. Many persons would like to have, and might then be enabled to possess, shares in this mine who are now prevented by their inability to invest sums of moderate amount, while the facilities which would thus be afforded for small investors would not fail to place the market value of the shares more on a par with those greater and increasing profits, which it will, undoubtedly, be the good fortune of investing shareholders shortly to obtain. HENRY RUTTER.

Warrington-crescent, Hyde Park, March 22.

SOUTH CONDURROW MINE.

SIR,—I have seen much correspondence in your valuable Journal, to which I look for a fair statement of facts. I have had the mine inspected, and ask the following questions, hoping that "Investor" or "Feeit," or the agents, will really set my mind at rest. Is not the rich bunch within 15 fathoms of Wheal Grenville boundary going west? not that this rich bunch will hold half the distance, but there may be another within 20 fms. which would be of no value to the shareholders of South Condurrow. Is it not a fact, also, that the present engine has not power sufficient to sink the mine, and is this the reason we hear nothing of the lode below the 82 fm. level? Are not two engines required, and would it not have been the better policy to have put up another pumping-engine of ample power, and brought up the cost before paying a dividend? For should this rich bunch fall off I fear there is no place to which the men in the mine could turn to keep up the returns. These are questions which should be replied to, and for the welfare of mining I ask for an unvarnished statement.

VERITAS.

ROSE AND CHIVERTON MINE.

SIR,—In reply to a "Shareholder," in last week's Journal, I beg to say that I have a thorough knowledge of this property, and if any practical miner were to inspect the adit level on the back of these lodes and the 20, he would find the lodes here of the same character as in East Wheal Rose, and the strata will bear comparison also, so that depth is only required to make this equal in riches to the old mine. The engine-shaft is now 18 fathoms below the 20, and in a few months the lodes will be intersected at the 45, where I have no doubt great riches will be met with, and the shareholders handsomely paid for their perseverance.

Newlyn, March 22. A MINER OF THE DISTRICT.

THE TERRAS (TIN) MINE.

SIR,—The proceedings at this mine give general satisfaction, more especially amongst the fortunate shareholders. Still, there are fault-finders who hoodwink themselves, and those who place faith in *perfection*. "Let those laugh who win" is an old axiom. The Terras people can afford to use the term in its proper sense. If they have not been deluded into extravagant prices by sharebrokers, they who went in at the beginning can now reap a rich reward, and will soon be able to obtain a still greater prize. The East Terras is quite as good a property to be developed, and I recommend publicly any parties who want to buy, with a probability of a rise in value, to take a few shares in the East Terras at par. That there may be no misunderstanding I sign— GEO HENWOOD.

[For remainder of Original Correspondence see to-day's Journal.]

CUTTING METALS.—Mr. E. LAWRENCE, Northfleet, Kent, employs for this operation a saddle piece or frame, which may be compared to the movable head-stock of a lathe; the saddle piece is provided with a tool holder and cutting tool. A gauge ring or collar being first dropped over the top of the pile, it is temporarily secured thereto by set screws or other equivalent means. The piston of this guage ring is determined according to the length of the metal to be cut off. The saddle piece with tool holder and cutting tool is then dropped over the top of the pile, and is carried by the gauge ring or collar, on which it is free, and caused to rotate either by working capstan bars inserted into suitable bosses formed in the saddle piece of the machine, or the cutting machine might be rotated by steam power. The tool holder is attached to a screw and ratchet wheel, and the tool holder with cutting tool secured in it has a uniform rate of travel imparted to it by an arrangement of self-acting "feed," in accordance generally with the following desciption. The inventor clamps or otherwise temporarily secures to the pile or other object to be cut at right angles thereto, and at a height proportionate to the amount or rate of travel desired to be given to the cutting tool, a bar or rod, which as the saddle piece is rotated comes in contact with a pendent lever or arm, the upper end of which takes into the ratchet wheel on the end of the actuating screw spindle of the cutting tool holder.

MINING IN AUSTRALASIA—MONTHLY SUMMARY

Gold digging in South Australia was quiet during January, having been somewhat interfered with by the harvesting operations; there are, however, a considerable number of diggers at work at Barossa, and Green Hill still holds her position, and seems likely to do so. The proprietors of Endeavour Mine, Mount Torrens, have expended about 40*l.* in testing their reef (the mine is 12,000 ft. on the course and 250 ft. wide), and are so satisfied with the result that they are about making arrangements for the purchase and erection of crushing machinery. The reef has been proved to a depth of 60 ft., and is there 4 ft. wide, in easy country.

Application has been sent in to the Commissioner of Crown Lands, under the Murray Flats Bill, which has just received the Governor's assent, by Messrs. W. C. Smith and J. Copeland, accompanied with the necessary deposit of 100*l.* They have thus secured, for the Act leaves no alternative to the Government but to grant the application, the right of search for gold over the whole of the Murray flats, "with a view of selecting thereout a block of 10,000 acres," and they can "at any time within nine calendar months from the time of depositing such sum" make application for lease for the said block, such lease to be issued at a pepper-corn rental, and to be for a period of five years. During the currency of such lease the lessees are to spend an amount equal to 2000*l.* a year in actual mining for gold in the lands leased.

The first report of the Gold Fields Warden contains much valuable information as to the history and prospects of gold discovery in the colony. About 500,000*l.* worth of the precious metal has been raised in South Australia. Chapman's Gully alone during three years yielded about half that total, and although only embracing an area of 40 or 50 acres, it gave permanent employment for many years to 20 or 30 diggers. Mr. Peterswald condemns the plan upon which reefs are worked in South Australia, and concludes that, unlike Victoria, the colony has been subject to great upheavals, and that the gold which has hitherto been found in South Australia has by this process been detached from the settled auriferous country, which will only be found at a great depth. He confidently anticipates that a system of deep sinking will lead to the most valuable results, opening up an entirely new era in the history of South Australian mining enterprise.

The Almanda Silver Mining Association have suspended operations for want of funds, and propose to communicate with an agent in England, with a view of disposing of sufficient shares to provide capital for subsequent operations. About 6000 ozs. of standard silver has been shipped, and realised on the London market, and the company has a balance of assets over liabilities of 484*l.* 14s. 7d. Additional working capital seems to be all that is required.

The copper mines on Yorke's Peninsula are gradually developing new resources. Paramatta is looking well, and at Yelta they have about 80 tons of ore raised during the month.

AUSTRALIAN MINES.

YUDANAMUTANA (Copper).—The superintendent (Adelaide, Feb. 1) states—"In reply to your question as to why we cannot raise any ore from the new lode at the water level, I beg to quote Capt. Terrell's own words—'It is a splendid lode, but if it had been as rich again we could not sink upon it until the main shaft is down to the level, as we have no means of raising the water.' He further remarks, with reference to the new shaft, that 'it will go through new ground nearly the whole way down. I expect to reach the water about July next.' The most important news for the month is the cutting through a very nice lode of ore dipping north in sinking the main shaft; it is about 18 inches wide, and as soon as we are down to the 25 we shall be able to work upon this lode. The ground in sinking is becoming softer, a very important feature both as regards the chance of our making fresh discoveries of ore, and also the cost of further sinking. Your instructions as to getting the mine inspected and thoroughly surveyed and reported upon by a reliable man shall have my immediate attention." Capt. Terrell reports, under date Jan. 23—"Blinman Mine: The new shaft is now down about 23 fms.; I am very anxious to get this shaft down to Hill's lode, and the necessary machinery erected to prove the mine to be second to none in the colony. The stopes have turned out some good ore during the month, quite sufficient to keep two furnaces going. The returns would have been greater but for the Christmas holidays. Ore raised and smelted, 187 tons; copper made, 16 tons 15 cwts."

AUSTRALIAN UNITED (Gold).—The directors have advices from Mr. Kitto, dated Jan. 30. On the Central Mine, Capt. Angove reports to Mr. Kitto as follows: "I have the honour to report that the drive from the eastern jump-up was continued about 30 feet south. The gradual ascent of the drive for that distance brought us with the wash-dirt, about 18 in. below the back lathes. The wash is about 18 in. thick; but in consequence of the great influx of water our progress was rendered very slow. The upper level being drained by this one, we deemed it advisable to drive from the winze eastward. That drive is now as far east as the eastern jump-up, and comparatively dry, and will no doubt continue so long as it is within the drivage of the former one. The wash presents a favourable appearance; but, as yet, we have not driven far enough eastward, in my opinion, to reach the golden ground. Your tributors will satisfy the most sceptical on that point within two months. The breaking in of the water, referred to in my last, has proved far more detrimental to the south and western ground than I had anticipated. No sooner had we cleared out the drives and resumed working than the water suddenly broke in upon one of the principal drives in the mine, filling everything with sand wherever it could find its way. The consequence has been that our yield has been very meagre as compared with that of last month; but I am happy to show a gradual improvement in our returns, so long as we can confine the water to run in one place—proving to a demonstration that the mine only wants properly draining and opening out, to make it a profitable investment. The system of tribute which you have now adopted will, no doubt, prove the Central to be a lasting and profitable mine." Mr. Kitto reports:—"Some 400*l.* worth of gold" as the return for the month, and adds—"If these accidents had not happened, the mine, instead of paying half wages, would have, in all probability, realised a profit. These accidents—of which little or no notice would have been taken if there had been funds in the colony to carry on the works—are, in themselves, very cheering, in so far as the eventual results are concerned; they show that we are approaching channels of heavy wash that require time to drain." With regard to the further working of the mine, Mr. Kitto reports having let the whole mine on tribute for 12 months from Feb. 1, and says—"What really would be thought of a mine in England that could be let on such terms. No cost to the shareholders, and probable large profits. Would such a property languish for want of funds? I think not." Owing to want of capital, the workings at the Duke of Cornwall Mine, Mr. Kitto reports, "had to be stopped, and just too as the hard belt of ground was pierced in the bottom cross-cut, and softer country reached. One party has taken a pitch at the 133, at 14s. in 1*l.*; and, luckily, accident opened to us a very wide lode just in the centre of the lease—which has hitherto been considered worthless—yielding 4 dwts. to the ton. On these points I hope to be able to employ a sufficient number of men to meet the covenants of the lease."

PORT PHILLIP AND COLONIAL (Gold).—The directors have advices dated Jan. 23. The quantity of quartz crushed during the four weeks ended Jan. 4 was 4486 tons; total gold obtained, 1428 ozs.; yield per ton, including pyrites gold, 6 dwts. 9 grs. The receipts were 5349*l.* Payments, including 1134*l.* on account of timber and firewood, 4495*l.*; profit, 854*l.*, added to which was last month's balance of 2157*l.*, making an available balance of 3011*l.* The amount divided between the two companies was 1000*l.*, the Port Phillip Company's proportion of which is 650*l.* The balance of 201*l.* was carried forward to next month's account. The return for the two weeks ended Jan. 18 was—Quartz crushed, 2168 tons; total gold obtained, 747 ozs. 14 dwts., or an average per ton, including pyrites gold, of 6 dwts. 21 grs.; remittance, 600*l.*

The directors have received the following telegram, dated Galle, March 19, in anticipation of the mail leaving Melbourne on Feb. 28, and due here on April 15:—Last month, ending Feb. 1, the yield was 6 dwts. 3 grs.; two weeks, ending Feb. 15, 6 dwts. 3 grs. Remittance, 4200*l.*—[The bulk of this sum is believed to be from Collins-street property.]

YORKE PENINSULA.—The directors have advices from the committee of inspection at Adelaide, dated Jan. 31, in which they report that they are making preliminary arrangements in the anticipation that instructions to re-open the Kurilla Mine would reach them by the following mail, and which will be the case, instructions having been sent from London in time to reach them in February last.

SCOTTISH AUSTRALIAN.—The directors have advices from Sydney, dated Jan. 27, with reports from Lambton Colliery to Jan. 23. The sales of coal for the month of December amounted to 16,361 tons, making a total for the half-year ending that date of 86,659 tons.

ENGLISH AND AUSTRALIAN (Copper).—The directors have advices from their manager, dated Port Adelaide, Feb. 1. The quantity of coal at Port Adelaide was about 1199 tons. There were two smelting, two roasting, and one refinery furnace at work at the Port works. The 104 tons of copper, advised by the last mail as ready for shipment, had been shipped, and a further quantity of about 126 tons was in course of shipment.

THE VICTORIAN GOLD, AND THE GOLD FIELDS.—The average number of persons engaged in gold mining steadily decreased during the whole of last year. The average for the whole of 1869 was 68,037; in the first quarter of 1870 it had fallen to 62,206; in the second to 60,267; in the third to 59,742; and in the fourth to 59,254; making the average for the whole of last year 60,367 The following table gives the last average number of miners employed in Victoria, and the quantity of gold produced, for the last five years:—

Year.	No. of miners.	Yield of gold.
1866	73,479	Ozs. 1,536,581
1867	65,857	1,493,831
1868	63,181	1,474,187
1869	68,037	1,367,903
1870	60,367	1,281,841

The question of reform in the mining laws is just now commanding great attention, the opinion of nearly all concerned in gold mining being that, with increased facilities to the miners and the abolition of many objectionable restrictions at present imposed on them in their pursuits, a largely increased yield of gold would be obtained. Berlin, the country of large nuggets, has during the last month eclipsed all its previous efforts by producing an enormous lump of gold, weighing no less than 1717 ounces. The *Inglewood Advertiser* thus writes of the discovery of this valuable find and of the Berlin gold field generally:—"Notwithstanding the enormous amount of gold, principally in large nuggets, which the Berlin gold field has yielded since its opening, two years and a half ago, it seems that the extent and richness of its auriferous deposits are far from having yet been ascertained, and every day proves more and more conclusively the truth of the opinion we formerly hazarded—that Berlin stands unrivalled as an alluvial digging, except by Forest Creek and Bendigo in the old palmy days of 1852 and 1853. So far from the field having become exhausted in a few months, as was predicted by some persons when it was first opened, every fresh discovery has exceeded in importance the preceding one, and has enlarged the boundaries of the field to a degree which could not have been foreseen, even by those who thought most favourably of its capabilities. Like every other gold field, it has had its mutations, and though towards the end of last year complaints were

rife among miners and storekeepers that things were rather dull, yet the present year has begun with prospects as bright as ever. On Thursday, Jan. 8, the largest nugget yet found on the field—a splendid lump of gold, weighing 1717 oz.—was unearthed in Catto's paddock, Johnstown; and a correspondent, writing from Johnstown on the same day, reports:—'Mr. Johns is going to throw open to the miners another paddock, known as Johns' grass paddock, midway between Johnstown and Tyler's. In this paddock Messrs. Bishop Brothers have been prospecting for the last month or two, and have nuggeted out about 12 oz. of gold, consisting of two pieces, weighing respectively 8⅛ oz. and 2½ oz., and the rest of fine gold. A great rush has set in, and it is expected that the whole of the claims will be taken up as soon as they are surveyed for letting.' In another direction, at Christmas Flat, a 21-oz. nugget was got on Friday, and several parties are getting payable gold."—*Melbourne Argus, Jan.* 30.

FOREIGN MINING AND METALLURGY.

The fusion of the Châtelineau and the Marcinelle and Couillet Metallurgical, &c., Companies, is now an accomplished fact. General meetings of the proprietors in the two companies approved this useful measure proposed by their general councils, and a royal decree subsequently gave final official sanction to the measure. The first few months of 1870 seemed to open out a new era of prosperity for the company formed by the amalgamation, but the activity which appeared to be commencing was greatly checked by the war which broke out in July on the Belgian frontiers. Everything at first promised a favourable balance-sheet for 1870-1; but it will be readily understood how public events have exerted an extremely adverse influence on the financial results of the exercise. The total amount of the operations of the company in 1869-70 was 480,083*l.* The production of pig in the company's blast-furnaces was 64,476 tons; of iron in the rolling-mills, 40,303 tons; and of coal in the collieries, 5,133,369 hectolitres. The value of the work executed in the company's construction workshops was 183,635*l.* The number of workpeople employed by the company during the exercise was about 6500. The balance-sheet of the Sclessin Company to June 30, 1870, would have enabled the directors to distribute, in addition to statutory interest at the rate of 5 per cent. per annum, a dividend of 6s. 6d. per share, or about 2½ per cent. The Council of Administration, however, as a measure of prudence, only distributed a dividend of 5s. per share. This company, like the Marcinelle and Couillet Company, in addition to general metallurgical industry, also applies itself to the construction of machinery, locomotives excepted.

We are still without any precise data as to the prices of iron in Champagne, in the Moselle, and in the Ardennes; all that can be said is that if communications were regularly re-established deliveries would be made for the provinces, and also for Paris, on a vast scale, seeing that orders given out before the war have not yet been fully executed, and that the requirements of consumption are great. Some of the forges in the invaded districts have not altogether suspended their production, notwithstanding the German occupation; stocks are consequently in these cases pretty considerable. The markets of the Department of the Nord are in a very quiet state; at the same time orders begin to become numerous, and a serious revival in affairs is anticipated. Little or nothing is, of course, passing at Paris, in consequence of the unhappy disorders prevailing; some warehouses have sufficient supplies on hand to enable them to meet the immediate requirements of industry, but most of them still want iron. It appears certain that if peace and confidence could be re-established transactions would soon assume a satisfactory aspect, as merchants require to make good the deficiencies in their stocks, while it is necessary to repair the disasters occasioned by the defence and bombardment of Paris.

The condition of the Belgian iron trade is still considered to be improving. Prices have acquired much firmness, and work is abundant. The conclusion, it is hoped, of the war between France and Prussia induces expectations of a prompt return to a period of activity similar to that upon which Belgium had entered when the outbreak of war in July, 1870, occasioned such terrible confusion and disorder in the financial, commercial, and industrial worlds. The beneficent influence of peace has already made itself felt, and Belgian metallurgical industry seems to be experiencing the first effects of it. One important affair has been carried through since the close of the war—viz., a contract for 12,000 tons of rails, secured by MM. Adhemar, Le Roy, and Co., for the Central Pomeranian Railway. An adjudication for another 2000 tons of rails for the Dutch State Railways has taken place at Amsterdam. Several English and Belgian firms took part in the adjudication; and the contract was let to MM. de Dorlodot Frères, of Acoz, although the price they asked was a little higher than that asked by Bolckow, Vaughan, and Co. (Limited). The tenders were as annexed:—Bolckow, Vaughan, and Co., 176,860 fl.; MM. de Dorlodot Frères, 177,500 fl.; Hopkins, Gilkes, and Co. (Limited), 184,450 fl.; Messrs. J. Whitham and Sons, Leeds, 197,175 fl.; the Ebbw Vale Steel, Iron, and Coal Company (Limited), 204,400 fl.

Contracts have just been let at Charleroi for coal required for the Belgian State Railways. There was not a very great difference between the tenders delivered, but prices generally displayed an upward tendency, which appears to have been justified by current circumstances. The state of the Belgian coal trade has exhibited no very material alteration. Business on home account is tolerably active, but a certain irregularity still prevails in connection with exports. As regards the future relations of Belgian collieries with France, the opinion appears to be gaining ground that no great change will take place, since coal being a matter of absolute necessity to French industrials the French Government will not dare to impose new heavy import duties upon it. It remains, of course, to be seen whether this opinion is well founded or otherwise. The Montrambert (France) Colliery Company is paying a dividend of 3s. 4d. per share.

The continental copper markets have shown a fair amount of steadiness, upon the whole. At Marseilles, Toka has made 80*l.*; refined Chilian and Peruvian, 80*l.*; and rolled copper in sheets, 84*l.* per ton. The German copper markets, without presenting much animation, are in a satisfactory state. At Rotterdam, Drontheim has made 50 fls. to 52 fls. Banca and English tin have not experienced any change of price at Marseilles; the present quotations are high. The German tin markets at the last dates were rather less firm. The Dutch tin markets have also shown a certain weakness. At Rotterdam, Banca has fallen from 77½ fls. to 76½ fls.; this price appears rather high having regard to the state of affairs in general, and the position of the article in particular. For some little time there has been scarcely any Billiton upon the Dutch markets, but at the last dates several cargoes were being discharged; the working of Billiton is always increasing, and shows an advance in 1870-1 of more than 30 per cent. as compared with 1869-70. At Marseilles lead in saumons, first fusion, has made 18*l.* 8s.; ditto, second fusion, 18*l.* to 20*l.*; ditto in shot, 20*l.* 16s.; ditto rolled, and in pipes, 20*l.* 16s. per ton. At Rotterdam, Stolberg and Eschweiler have made 11 fls.; ditto German of various marks, 10¾ fls. At Marseilles zinc in plates has made 19*l.* 4s.; ditto rolled, 30*l.* per ton. Comparatively little business has been passing in zinc in Germany.

FOREIGN MINES.

ST. JOHN DEL REY.—The directors have received the following report, dated Morro Velho Feb. 17:—Morro Velho produce for January, 30 days only, 10,281 oits., from 4167 tons ore; yield, 2·467 oits. per ton. Morro Velho cost for January, 451*l.*; loss for January, 413*l.* Morro Velho produce, eight days of February, 2850 oits.; yield, 2·634 oits. per ton. Remittance received, 21,263 oits. New shafts sunk, 15 days February—A shaft, 3 fms. 0 ft. 2 in.; B shaft, 2 fms. 0 ft. 6 in.—5 fms. 0 ft. 8 in.

DON PEDRO (Gold).—Mr. F. S. Symons reports for January: Produce, 7384 oits., at 8s. 6d. per oit., 3138*l.* 4s.; cost, 3357*l.* 18s. 3d.; loss, 219*l.* 14s. 3d. The force is the highest we have yet had, and the produce exceeds that of December by 973 oits. The ground in the middle adit has improved, and progress is made at the cross-cut from Vivian's. On the whole, we commence 1871 under favourable auspices.—Permanent Machinery: We have now a very large quantity here, about 4000 arrobas (about 57 tons), and the fitting together of different parts will shortly be commenced. The excavation of wheel-pit will be finished in the commencement of March, and a large number of hands freed for other duties. For the first division of February Mr. F. S. Symons reports: Remittance, 14,058 oits.—balance of December produce, 5361; January produce, 7384, to Feb. 12, 1313 oits.—Mine: The general body of lode excavated has yielded fairly, and yesterday boxwork was taken from the curve that yielded about 3 00 oits. From this line, which failed so unexpectedly on the 29th, we will again make. The re-opening of Treloar's level, where driven through flookan, has been completed. The ground at the middle adit has improved, and good duty accomplished; as an incentive, men will receive this month 4*l.* per fm. driven in lieu of overtime. Explorations are being vigorously pushed on at Tambor and Mato das Cobras; for the former place a tye has been made, through which all the lode excavated will be passed.—Copy of telegram from Lisbon: weighed to Feb. 28: 4954 oits.; estimate for Feb., 6900 oits.

ANGLO-BRAZILIAN (Gold).—Mr. F. S. Symons reports for January: Produce, 1979 oits., at 9s., 890*l.* 11s.; cost, 1509*l.* 9s. 3d.; loss, 618*l.* 18s. 3d. Works have been carried on with regularity, and attendance about the same as in December, but the mineral treated has not been quite so auriferous. A large quantity of water has been let down from a section of the Fundao Mines by a long borer-hole driven from Foster's Fundao stope No. 1. For the first division of February Mr. F. S. Symons reports: Remittance, 4029 oits.—produce for December and January. Attendance is improving; sick list favourable, and we have opened a communication to the Fundao from Foster's Fundao stope No. 1. The excavations are being secured with timber, and cleared of the accumulation of stone, addle, &c., about 16 wagons of which are being sent to stamps daily—all auriferous. A careful separation of the stone will shortly be made.

GENERAL BRAZILIAN.—Capt. T. Treloar reports for January: On the whole, the weather has been favourable, and fair advancement has been made at all points but the shallow adit St. Anna. The latter to date continues our plague spot, and heavy rain adds to our trouble.—St. Anna: At the old adit we have reached the old workings, and though they have evidently been very wet, they are now dry. At the shallow adit 9 ft. have been advanced; this place is very wet, and we are not yet free of disturbed ground.—Itabira: The shallow and middle adits are progressing fairly; in the former bars of compact iron mica slate have been encountered, and in the latter we are not yet free of the talcose clay or flookan. For the first division of February Capt. Treloar reports: The general operations to date have presented no change calling for special remark. Weather, on the whole, still favourable. In the old adit at St. Anna we have not yet reached the footwall. Matters at the shallow adit are unchanged, and if no improvement takes place when the next set of timber is put in the Brazilian adit will be opened for side-tie. The ground in the shallow adit at Itabira is compact, and requires blasting occasionally. The middle adit is free of flookan. Additional explorations taken in hand, and force satisfactory.

JAVALI.—The managing director in Chontales reports for the month ending Feb. 6 as follows:—The cross-cut in the upper portion of Socorro, spoken of in last report, has been entirely completed, and now communicates not only with parts under the surface, but also by a shoot with the lode on the surface. This relieves us of a source of great anxiety, by giving us access to a large and cheap supply of good ore, as, owing to no preparation being made during the last dry season to ensure a continued supply of ore for the mill during the present grinding time, all that could be done after our re-organisation of the establishment was to take whatever ore we could lay hands on; but we were fully aware that through any accident on our tramway, the clogging of our shoots through which the ore has to pass from one level to the other, the non-compliance of our ore contractors with their time bargains, or through any other hitch affecting the delivery of ore at the stamps, there was no choice but to stop the mill. Once or twice we have been in positions which showed us the danger of this involuntary living from hand to mouth, but we always succeeded in pulling through somehow. During the present month, however, heavy rains made our ore cloggy, our shoots choked up, our contractors unable to deliver the ore required, and, to make matters worse, the critical day happened to be a Catholic festival (Candlemas), when no native would work; we, therefore, determined to employ the enforced idleness of the mill by cleaning up our batteries and pans, though by doing so we shortened our grinding time by several days, and cannot, therefore, remit more ounces than we did last month, but we do send 322¼ ozs. As the mill started again on Feb. 3 twenty stamps the incident is unimportant, as the next month will get the benefit of the earlier start; but it shows the absolute necessity of accumulating during the coming dry season, as we now shall do, plenty of ore at the mill and at all the shoots, or else we may find ourselves at a complete standstill through no fault of the mill. Another important benefit arising from such an accumulation would be the cheapening of the supply itself. It is impossible for us to get ore at what may be termed the fair market price of the district so long as it is perceived that every ton of ore that by hook or by crook can be got to the mill is an object of importance to us; and if labour were less abundant and competition less active than they are we should not have been able to bring down our expenses so low as we have done. Even now we take the lead in the reduction of wages, and within these last few days both surprised and convinced some of our neighbours that we are working at a rate which they thought absolutely impossible. Whilst by means of the cross-cut now completed, and by accumulating ore during the coming dry season through this and all our other channels of communication, a falling short of ore supplies will be guarded against, duplicate sets of important pieces of machinery will neutralise any accident in our reduction works. I have tried to remedy the source of a third great embarrassment which the manager of this mine had to face, by entering on Feb. 3 into an agreement with Mr. Belt, by which we bind ourselves to construct conjointly a reservoir of sufficient size for supplying us with water during the dry season. The permanent importance of this work it would be difficult to exaggerate, and in agreeing to its construction I have been influenced by the instructions which at any early date of our company's existence Mr. A. A. Pollock sent to the then manager, the substance of which was that a search should be made for streams that might be diverted into our water-course, or that one of the valleys be dammed up. Our mine being by far too near the top of our water-shed to make a diversion of stream commensurate with the expense that would have to be incurred, and any benefit to be gained by bringing water supplies from the Carca water-shed having to be bought at a heavy cost for tunneling, I determined on a reservoir. This could have been formed on our own property, but the objection to it was that the tailings of the mills situated above it would be discharged into it, and we should have had to pay the entire cost of its construction and maintenance, whilst by making it at San Sebastian, conjointly with our neighbours, we do so at one-half of the cost, and keep of the reservoir for silting up with tailings. We have only driven 2 varas in Pim's tunnel, where the lode is just now hard, and have concentrated our energy on Pollock's tunnel, where good ore has been obtained by working levels Nos. 6 and 7, 9¾ and 18 varas respectively, the balance of ore needed being made up of stuff formerly neglected. The above-mentioned completion of the cross-cut in the Socorro has enabled us to attack the highest point of the mine (500 ft. above the Posol Javali river bed), where we commenced stoping, which gives us ore of good quality, and cheaper than we have been ever able to obtain it (about 1s. per ton). The farthest point of our mine is yet driven—Pollock's tunnel—is tractable, and of excellent quality. The mill has worked 22 days with 20 stamps without any accident; and though we are close upon the dry season, the water-power, somewhat diminished, is still sufficient for our purpose, and there is reason to believe that we shall have enough till March. The health of the district is excellent, and labour is abundant. The expenses for January are $2762·16, thus leaving again a substantial profit on the month's work.

ROSSA GRANDE (Gold).—Mr. Ernest Hilcke reports for January: The gold return for the month amounts to 474 oits.; total cost, 889*l.* 10s. 11d. The operations have been carried on with regularity, and the attendance of force has been increasing. The great diminution of our richest body of lode in the stopes below the 50 and barrow-road I am sorry to say has been sadly telling against this month's produce. By continuing the 60, which was commenced west of Dale's shaft in the beginning of the month, we hope to encounter bunches of rich lode again, and it will, therefore, be pushed on with all speed. The lode from the shoot of Mina do Alto, in the 40 west, though of good size, has not yielded so well as expected. The auriferous quality of the stone has been very deceptive; samples taken from it have shown very fair portions of gold, yet, on the whole, it has been poor. The supply of ore during the month has been nearly all obtained from this place, and yielded only 4·4 oits. per ton. For the first division of February Mr. Ernest Hilcke reports: Remittance, 2566 oits., being produce for December and January.—Mina de Serra: The feature of the lode at the various sections is much the same as when last reported on, excepting the 60, west, where the lode is somewhat improving in size.

BATTLE MOUNTAIN.—Capt. Richards, March 2: Virgin: Hallow's shaft is down to the 113 ft., where a driving has been commenced on an east and west lode just come into the shaft; it is from 8 in. to 1 ft. wide, composed of gossan, mundic, prian, and occasionally spots of black oxide of copper, and it is intended to continue on the course of this towards the main lode for some little distance, probably until it intersects it. In the bottom of Roach's winze there is what appears to be an east and west lode, probably the same, and this may have been the cause of the disturbance of the lode therein. The present 113 ft. driving, north of the shaft, will prove this, and when communicated with Roach's winze we shall be enabled to put in a stull in back of the 113 ft. level, when the ore in the back thereof will be taken away at a much less cost than by any other mode. The change of ground in the shaft dips northward, and, as it is composed of gossan principally, it looks more like the back of a lode than anything else, and probably is evidence of a course of ore below. In the 73 ft. level north the lode is 4 ft. wide, proved to be so by a cross-cut driven since last report; the lode is not without ore, but not enough to value. The stope in back of the 73 ft. level north continues to produce some good paying ore. In the stope in the 73, south of Roach's winze, the lode is of immense width, and orey all through, but we cannot take away the ore to such an advantage by a good deal as we shall be enabled as the 113 ft. level comes in, and which, as the ground is good for driving, we shall soon, I hope, accomplish.—Lake Superior: Pryce's shaft has been temporarily suspended, and the men put to Moore's rise in back of the 70 ft. level south, for the purpose of getting ventilation. The lode is, the part we are carrying, 2½ ft. wide, composed of rich black oxide and green carbonate of copper, and is a good paying lode. I consider nothing can exceed the fine indications here, and as we shall, when we can, resume driving the 70 ft. level south towards the junction of this lode with the engine lode, there is every probability of their making immense deposits of mineral. Ore at mines and San Francisco, unshipped, 3853 bags. The weather has been exceedingly rough, but is fine again.

BRAGANZA (Gold).—Capt. Roberts, Feb. 16: A Deep Adit: The tramroad is nearly completed into the winze, distance 50 fms., and a turntable put in to turn on the course of the lode.—B Cross-cut: The men have driven 2 fms. 1 ft. north and south of the cross-cut on No. 3 lode. I cannot say the size of the lode at this point, as we are only driving a common level about 4 ft. wide, without foot or hanging wall; a more splendid looking lode for being auriferous no man would wish to see.—C Cross-cut; We have blasted down some of No. 1 lode, made a good platform and barrow-road; No. 3 lode rising in the back of this same cross-cut. This lode will be easily taken down under hand after we hole.—D Cross-cut: Driven total length 40 fms. 2 ft., all on the course of the lode, and will leave us nearly 40 fms. backs that can be stoped away very cheaply. At this point we have a further rise to the shallow cross-cut, when we shall lay open 800 fms. backs on No. 3 lode at this level, besides what will be standing north towards the Rasgao. This lode is intersected at five different cross-cuts, and opened upon from the deep adit, some 600 feet high, so we can calculate on thousands of fathoms of ore ground on this lode alone. In consequence of the unusual wet season we have been obliged to partially suspend working the small stamping mill, to enable us to erect new stamps under one and the same roof. At this time of the year out-door labour is very tedious, and hence many delays occur, but I am happy to state we are going on apace with the new stamps.

ANGLO-ARGENTINE.—Capt. J. Vivian reports for January—South Mine, Captain: As soon as the engines commence pumping sinking the shaft will be resumed, and we shall push on as fast as possible in view of reaching the point where the main lode will be met with in the shaft, at which point a very rich and valuable discovery is anticipated. We have commenced driving a cross-cut at the 44 towards the main lode, ground hard limestone; here also we look forward to cutting the lode very rich.—Manager: The lode is still large, but at present mixed with patches of limestone; this I consider only temporary. There is no doubt we have a very long and extensive piece of ore ground here.—Chairman Main Lode: The lode in the shallow adit, driving south, has improved in appearance. All our operations are progressing favourably, and prospects are of a cheering character. Reduction officer's report—I am still anxiously waiting the arrival of the apparatus and stores from England. Meanwhile a further study of the mineralogical character of the ores confirms me in the opinion I expressed in my last report of their value and facile yielding to treatment. I append a note of six assays of desmontes, which, in the absence of the requisite means here, we have been compelled to have made by Mr. Telho, in San Juan. They are samples from a large heap of desmontes, situated near the South Mine, and have been very carefully selected, with a view of securing a perfectly fair average of the whole. The total quantity is estimated at upwards of 1000 tons, and is all quite ready for treatment, having been carefully picked over, and the "dead mountain" thrown out. They give an average of 11·08 dwts. per ton.

ALMADA AND TIRITO (Silver).—Mr. Clemes, Feb. 13: January profit for month, $3175.—Feb. 20: Driving to the north much improved. The workings in Providencia are producing good ore—31 tons of pitanque ores shipped Mazatlan.—N. B. The last pitanque shipped was sold for 116*l.* 13s. 3d. per ton.

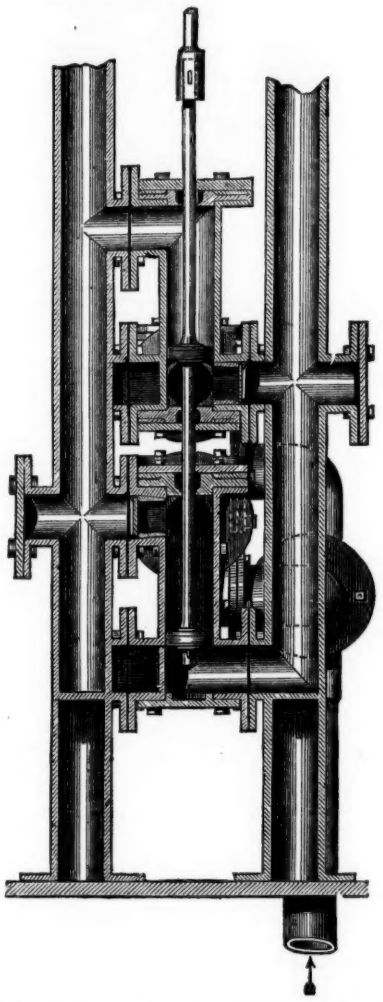
ECLIPSE (Gold).—The directors have received the following report from Mr. J. B. Francis (late reduction officer at the mine), under date Feb. 15:—I inspected the Eclipse Gold Mine to-day, and beg to hand you a few remarks thereon. Since Mr. Tregallas arrived at the mine he has commenced to drive south of the cross-course on a vein called Bluett's vein, or lode. I am glad to say it is a large lode, and producing rich silver ore, and running in the same direction as the Eclipse lode. The 160 ft. level is looking well, and producing good gold rock for milling. In the 220 ft. level the lode is 6 ft. wide, producing rich gold and silver rock. This speaks well for the next level, as we have found the lode to improve in depth. There are thousands of tons of ore discovered, which will last for years to take away. The ore that is and has been taken out of the mine is from the Eclipse lode, not from Barratt's cross lode—there is no Barratt's lode, it is a cross-course. The mine is working in a mining-like manner, and will soon be put in a good position.

EXCHEQUER (Gold and Silver).—Feb. 20: In the upper tunnel 7½ ft. were made, and the winze was sunk 5 ft. The water has materially decreased. We have now a very heavy fall of snow.

[For remainder of Foreign Mines see to-day's Journal.]

NEW PATENT EQUAL LEVERAGE PUMP, FOR THE DRAINAGE OF MINES, &c.

The first of Messrs. ALLBUT and ROBBINS' pumps is just completed and at work at Mr. Rowley's colliery, Old Field, Tipton Green, Staffordshire, and is exciting considerable interest in that district among mining circles. A meeting has been arranged to take place shortly, to inspect the invention in operation, and to hear an exposition of the peculiarities by the patentees.



The invention consists of the following combination or arrangement of parts of pumps for raising and forcing liquids, by which the column of liquid raised and forced is balanced, and thereby raised with greater facility than in pumps of the ordinary construction. There are two vertical pump cylinders and solid pistons without valves working through stuffing-boxes, at the top, as shown in the annexed engravings. The lower ends of these pump cylinders are connected with the fore ends of two short horizontal cylinders respectively, the axes of the horizontal cylinders being in the same line. The pistons in the horizontal cylinders are connected to the opposite ends of the same piston rods, so that when the piston in one of the horizontal cylinders is making its advanced stroke the piston in the other is making its return stroke. The suction pipes are connected to the rear ends of the horizontal cylinders, and have valves opening upwards as usual. Into the rear end of each of the horizontal cylinders the lower end of an oblique pipe opens, the upper end of which opens into the vertical pump cylinder connected with the other horizontal cylinder. Thus each vertical pump cylinder opens at its bottom into the fore end of one horizontal cylinder, and is also connected by the oblique pipe with the rear end of the other horizontal cylinder. Each oblique pipe has a valve in it opening upwards. The delivery-pipes are situated at the upper ends of the vertical pump cylinders immediately below the pistons. Each delivery-pipe has a valve or stop-cock, which is closed as the piston descends. The pistons are worked from cranks, eccentrics, or other appliances.

The action of the pump is as follows:—When one of the pistons descends it causes the water in its pump cylinder to force back the piston in its horizontal cylinder, thereby forcing water up the oblique pipe into the other or second pump cylinder. The simultaneous advancing of the piston in the second horizontal cylinder causes the water in front of the piston also to enter the second pump cylinder, and at the same time draws water through its suction pipe. Of the two volumes of water delivered into the second pump cylinder, only one volume passes out of the delivery-pipe, as the capacity of the second pump cylinder is increased during the forcing of water into it by the rising of its own piston. When the action is reversed by the descent of the piston in the second pump cylinder, and the ascent of that in the first, the actions described take place, but in the opposite pump cylinders. As the columns of water in the two pump cylinders are always balanced, there is great economy of power in working the pumps.—*Mechanics' Magazine.*

LONDON GENERAL OMNIBUS COMPANY.—The traffic receipts for the week ending March 19 were 917*l.* 16s. 11d.

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